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THE MICROSCOPICAL AND CHEMICAL EXAMINATION OF BLACK PEPPER.

By Henry Kraemer and Harry E. Sindall.

Black pepper is the fruit of *Piper nigrum*, a shrubby vine indigenous to the India-Malay region, and now cultivated extensively in tropical countries. An illustration of the plant is given by Baillon,[1] and by Engler and Prantl,[2] and an excellent historical account of the uses of pepper is given by Flückiger and Hanbury,[3] and also by Gildemeister and Hoffmann.[4] The fruit of *Piper nigrum* is the source of both the black pepper and white pepper of commerce, the individual fruits being known technically as "pepper corns." The former is the unripe, but full grown, fruit which has been allowed to dry spontaneously, or has been dried by means of artificial heat. White pepper, on the other hand, consists of the mature fruits from which a portion or nearly all of the pericarp has been removed. The parts removed in the preparation of white pepper are known commercially as "pepper hulls," or "pepper shells," of which there are several grades, depending upon the proportion of the different layers of the pericarp which is present. Pepper hulls can be purchased for much less than black pepper, and are frequently used to adulterate ground black pepper, and also enter into the artificial mixtures sold as black pepper.

The amount of pepper imported into the United States annually is estimated to be about 20,000,000 pounds, our importations coming principally through England. The commercial varieties derive their names chiefly from the points of export in the countries where they are produced. The following varieties are the ones

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which mostly reach the markets of this country: Tellicherry, Singapore, Aleppi, Acheen, and Lampong. Härtel and Will[5] have recently made complete analyses of these and other commercial varieties, and according to their results Tellicherry and Singapore pepper constitute the better grades of pepper.

Hartwich[6] was one of the first to show that the heavier the pepper corns the greater the value of the particular variety of pepper; and analysts are beginning to take cognizance of the comparative weights, the method being to determine the weight of 100 pepper corns. The following figures show the weights of 100 pepper corns

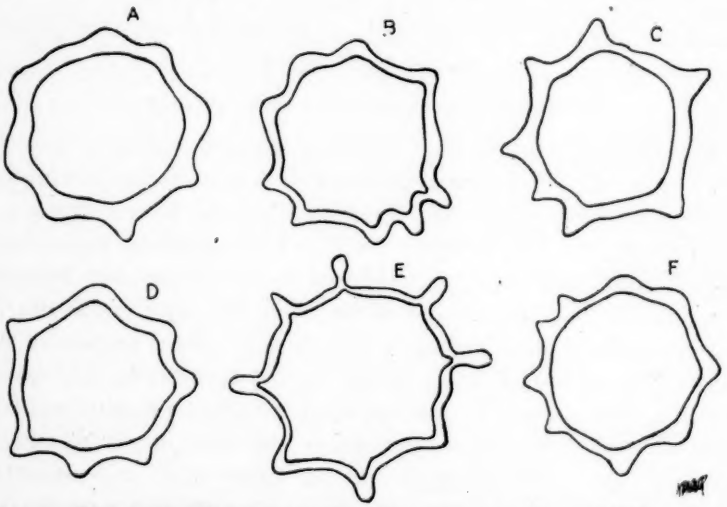

FIG. 1.—Diagrammatic representation of transverse sections of different varieties of black pepper. A, Aleppi; B, Tellicherry; C, Singapore; D, Acheen; E. Lampong; F, Bengal.

of several commercial varieties determined by the authors: Acheen, 4·452 grammes; Aleppi, 3·673 grammes; Lampong, 2·838 grammes; Singapore, (a) 3·935 grammes; (b) 4·013 grammes; Tellicherry, 4·412 grammes; Bengal, 3·527 grammes; unknown pepper corn, 4·272 grammes. These figures accord rather well with the figures obtained by Härtel and Will.[5] It should be said, however, that the specific gravity of the pepper corns would probably furnish a more reliable indication of quality, for the reason that the pepper corns vary in size, those of Lampong pepper being uniformly small. For example, while 100 pepper corns of Acheen, Singapore and

Tellicherry peppers weigh more than those of the Aleppi and Bengal varieties they do not show so large a proportion of oleoresin and piperine cells in the perisperm; and this seems to be borne out by the chemical data obtained by Härtel and Will[5] in the examination of Aleppi, Singapore and Tellicherry pepper.

MICROSCOPIC EXAMINATION.

A number of good monographs on the structure of black pepper have been published, the most important probably being those by Winton and Moeller[7], and by Tschirch and Oesterle[8]. It may be stated for the benefit of the practical worker that the illustrations given by these authors do not correspond in all particulars to sections of the commercial article, the drawings probably having been made from sections of fresh material.

One of the first observations made on the examination of cross-sections of pepper corns of the different commercial varieties is that the margin varies markedly in outline, and it would appear that the different varieties may in a measure be distinguished by this character. (*Fig. 1.*) In sections of Aleppi pepper the contour is undulate; in those of Singapore pepper it is characterized by broadly conical, obtuse or acute projections; and in Lampong pepper the projections are much longer, somewhat cylindrical, more or less rounded at the apex, and not infrequently somewhat narrowed at the base. In sections of the other varieties there are various gradations in the contour as shown in the figures. While an extended examination may show that this feature is merely a feature of different lots of the same commercial variety, we have found that, for example, in Lampong pepper, when the fruit is smooth, the epicarp has been removed in part, the projections always being reduced in height by the abrasions. This structure seems to bear a certain relation to the amount of oil and resin, that is, the pepper corns which have an undulate margin in section, as of the Aleppi variety, have the largest number of oil and resin cells, while sections of the Lampong fruits have the most pronounced projections and contain more undeveloped, and a less proportion of, oil and resin cells.

While there is no indication in the literature to show that there is a difference in the structure of the pepper corns of the different commercial varieties, it should be said that the figures by Moeller,[9]

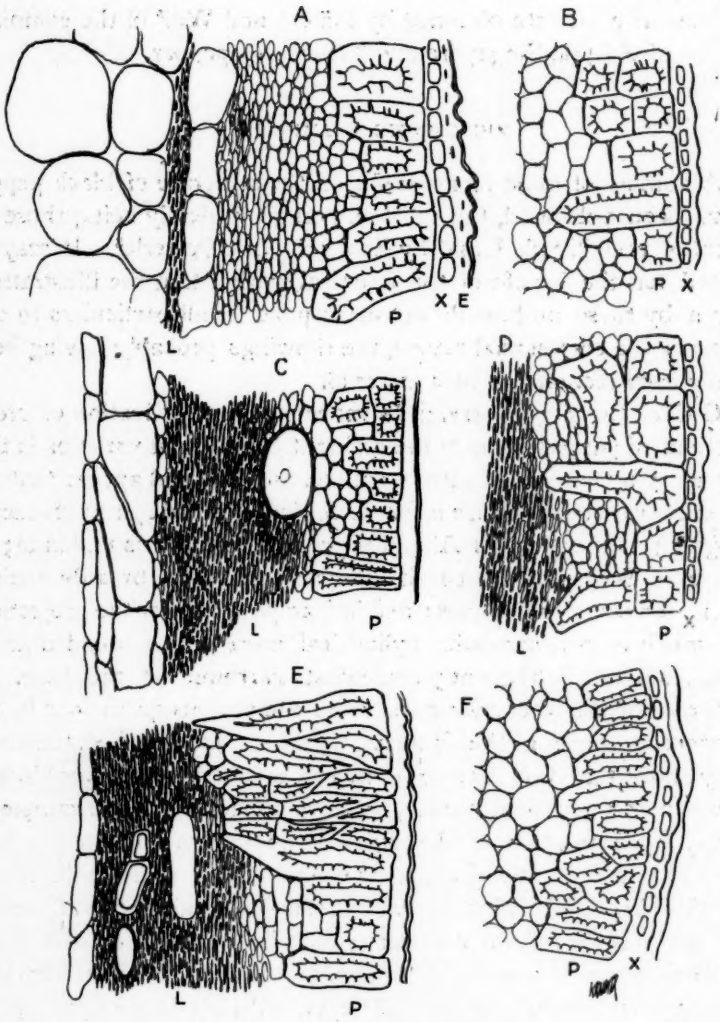

FIG. 2.—Transverse sections of outer portion of pericarp of the following varieties of black pepper: A, Aleppi; B, Tellicherry; C, Singapore; D, Acheen; E, Lampong; F, Bengal.

E, epidermal layer; X, layer of pigment cells; P, stone cells; L, collapsed parenchyma.

Winton and Moeller,[7] and Tschirch and Oesterle[8] can not be considered to be identical, but no statement is made as to the source of the specimens studied.

A careful examination, however, shows that there is considerable difference in structure in the pepper corns from different sources. Certain of the differences noted may be due either to the time of gathering the fruits, or to the manner of preparing them for the market. In Aleppi, Tellicherry, and Singapore peppers there is a sub-epidermal pigment layer, which is almost wanting in Lampong pepper. The lumen of the stone cells of the epicarp have very little pigment in Aleppi pepper, whereas in Lampong pepper the lumen of these cells contains a dark reddish-brown pigment, while in the other varieties the pigment is lighter in color. The stone cells of the epicarp vary both in compactness of arrangement and in the shape of the cells, as shown in *Fig. 2*. They also show a tendency to develop in certain directions, varying from nearly isodiametric or palisade-like cells, as in Tellicherry, Aleppi and Singapore peppercorns, to long tapering, as in Lampong, or somewhat shoe-shaped, as in the Acheen variety. The parenchyma cells beneath, and associated with, the stone cells in some varieties, as Tellicherry and Bengal, resemble ordinary parenchyma cells while in Singapore and Acheen pepper they are more or less collapsed, causing the oleo-resin cells to stand out rather prominently.

The lumen of the stone cells of the endocarp are quite different in different peppers (*Fig. 3*), those in Bengal and Singapore pepper having a reddish-brown content, which is almost wanting in the other varieties. In addition the walls of these cells are variously thickened. The oil cells above the stone cells of the endocarp are large and very distinct in Aleppi, Acheen and Singapore pepper, but much less developed in Lampong pepper.

CHEMICAL EXAMINATION.

The methods of analysis followed in obtaining the data here presented are those given by Leach[10] and adopted by the Association of Official Agricultural Chemists. The principal literature on the examination of black pepper is found in the *Zeitschrift für Untersuchung der Nahrungs- und Genussmittel* and *The Analyst* (London). The papers published by Winton and others during the past ten

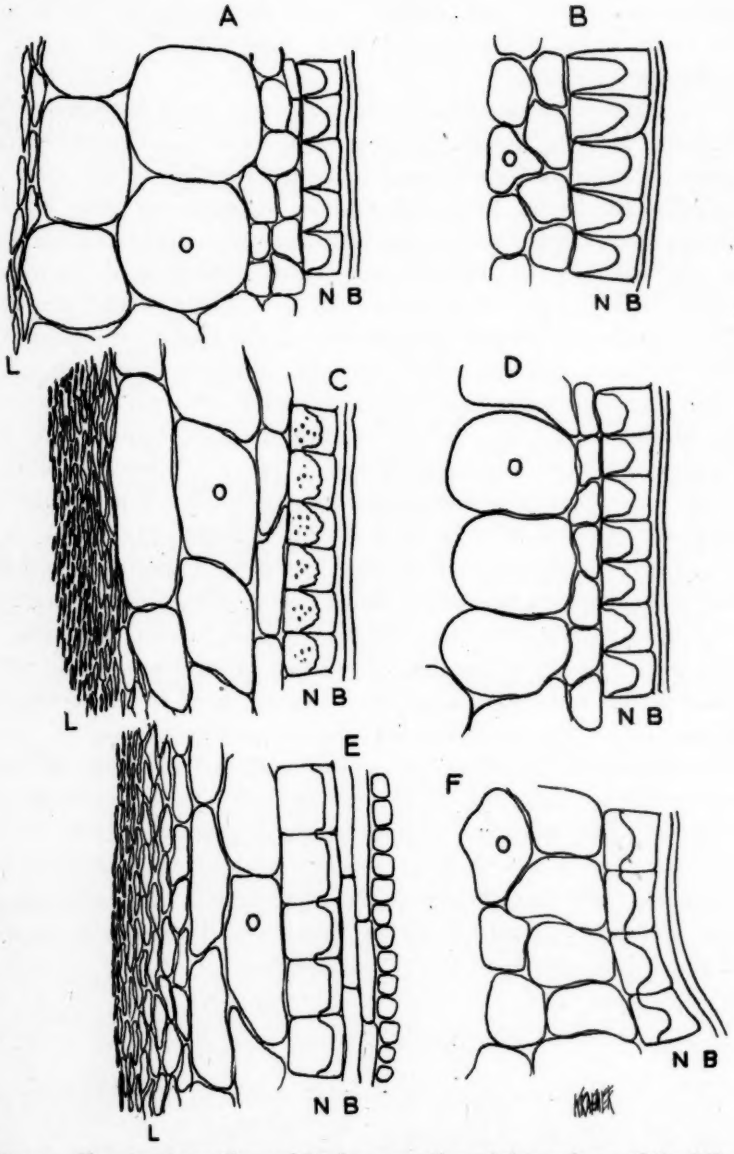

FIG. 3.—Transverse sections of the inner portion of the pericarp of the following varieties of black pepper: A, Aleppi; B, Tellicherry; C, Singapore; D, Acheen; E, Lampong; F, Bengal.

B, pigment layer; N, stone cells of endocarp; O, oil cells; L, collapsed parenchyma.

years in the annual reports of the Connecticut Agricultural Experiment Station furnish the best record of the work thus far done in this country. The only deviation from the methods of the A. O. A. C. made by the writers was in the determination of starch, where Allihn's original method for the determination of dextrose was followed in pursuance of a criticism by Winton.

The following data were obtained in the examination of six samples of Lampong pepper:

	Crude Fiber.	Total Ash.	Ash insoluble in 10 per cent. Hydrochloric Acid.
Maximum	14'50	6'45	1'40
Minimum	10'13	5'62	1'15
Average	12'69	6 05	1'37

The results of a more complete analysis of three samples of Lampong pepper are also given:

	Crude Fiber.	Starch.	Volatile Ether Extract.	Non-volatile Ether Extract.	Total Ash.	Ash insoluble in 10 per cent. Hydrochloric Acid.
1	13'70	. . . . .	0'78	9'82	5'27	1'25
2	11'44	. . . . .	1'25	9'00	5'70	0'90
3	14'48	39'07	. . . . .	8'90	6'36	1'15

The following figures were obtained in the ash determinations of different samples of the same lot of Lampong pepper:

	Total Ash.	Ash insoluble in 10 per cent. Hydrochloric Acid.
1	6'32	1'47
2	6'27	1'15
3	6'23	1'17
4	6'26	1'40
5	6'45	1'35
6	6'20	1'40
7	6'05	1 37

The following figures were obtained in the analyses of samples of ground pepper found on the market:

	Crude Fiber.	Non-volatile Ether Extract.	Starch.	Total Ash.	Ash insoluble in 10 per cent. Hydrochloric Acid.
1	16.66	9.51	35.33	6.49	1.15
2	16.54	10.44	44.62	6.74	1.76
3	18.60	9.37	37.69	6.31	1.03
4	25.56	9.96	37.50	6.50	1.10

The following special data were obtained in the examination of commercial samples of ground black pepper:

Ash.—Forty-one samples gave

	Total Ash.	Ash insoluble in 10 per cent. Hydrochloric Acid.
Maximum	6.91	2.08
Minimum	5.27	0.69
Average	6.15	1.17

Crude Fiber.—Thirteen samples gave

Maximum	26.10
Minimum	13.38
Average	15.10

Starch.—Eight samples gave by direct acid conversion

Maximum	44.24
Minimum	29.66
Average	37.83

Ether Extract.—Eight samples gave

	Volatile Ether Extract.	Non-volatile Ether Extract.
Maximum	1.70	10.44
Minimum	0.50	7.78
Average	0.86	9.27

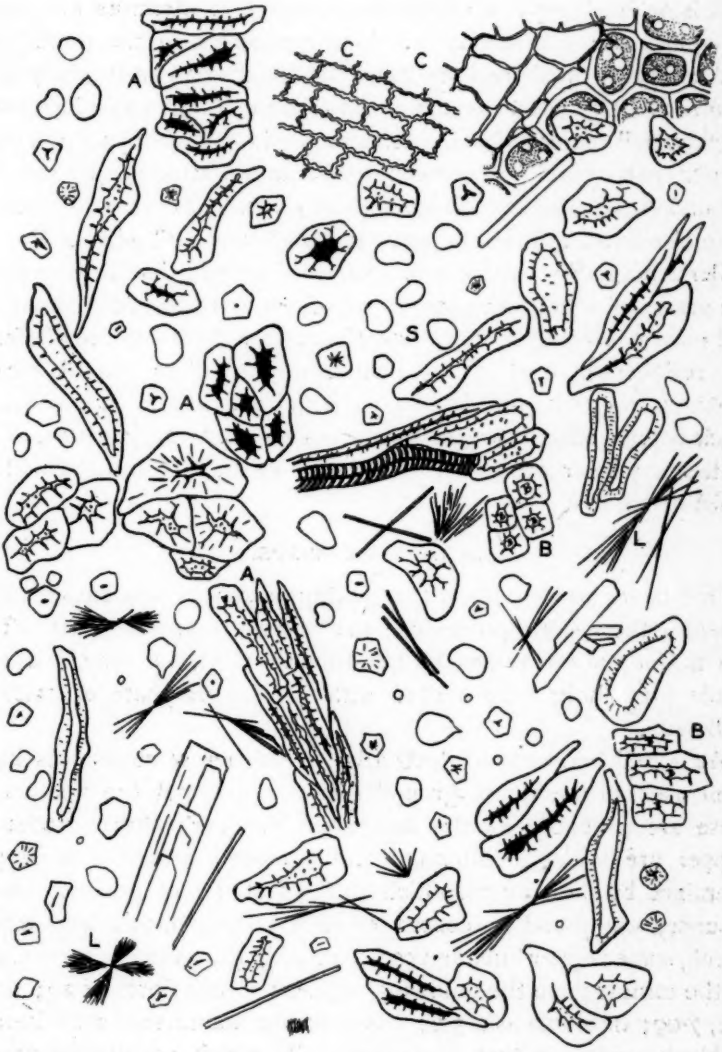

FIG. 4.—A mixture sold as ground black pepper: A, stone cells of olive endocarp; S, corn and wheat starch grains; B, stone cells of pepper hulls; C, fragments of seed coat and pericarp of cayenne pepper; L, crystals of calcium sulphate which separate on mounting the specimen in 25 per cent. sulphuric acid.

ARTIFICIAL PEPPER.

It is probably only in exceptional cases that attempts are made to sophisticate or adulterate whole pepper, and with the more general enforcement of the Pure Food and Drugs Law, it is likely that pepper adulterated in this manner will not continue to be imported. Heckmann[11] reported having examined a lot of white pepper, over 40 per cent. of which was composed of an imitation pepper consisting of barium sulphate. A number of grains of similar composition were also found in black pepper by Fischer and Grühnhagen.[12]

Bertschinger[13] reports having examined an imitation black pepper, the grains of which were composed of two portions, namely, a central mass consisting of wheat starch and an outer layer made from the residue obtained in the manufacture of olive oil. A recent sophistication that has come to our notice was in the case of some black pepper offered for sale that contained 15 to 20 per cent. of an imitation pepper composed of tapioca which was colored with a bluish-black dye.

ADULTERATED PEPPER.

One factor which affects the quality of pepper to a considerable extent is the neglect properly to garble and clean the fruits. The ash is not only increased by the adhering dirt, but sometimes the whole fruits have been coated with barium sulphate or calcium carbonate.

As is well known to analysts a large number of substances have been used to adulterate ground black pepper, but the number of these are probably on the decrease. The very cheap grades of pepper are usually adulterated, and a recent sample of a pepper examined by the authors, which retailed at 1 cent per box (about 1 ounce), was found to consist of olive endocarp, corn and wheat starch, some pepper hulls and capsicum (*Fig. 4*). A chemical analysis of the sample gave the following figures: Crude fibre, 44·26; total ash, 7·09; insoluble ash, 3·24. A common admixture or adulterant of black pepper is that of pepper hulls, which, as already stated, are obtained as a by-product in the manufacture of white pepper. In addition, ground black pepper may also be adulterated with olive endocarp (olive stone), almond shells or other similar products. Starchy substances are sometimes added, but these are readily

detected by means of the microscope, except in the case of buckwheat middlings, the starch grains of which somewhat resemble those of pepper in size but they do not form compound grains, as in pepper.

In addition to the starchy substances already mentioned, it is said that hard-tack and stale bread are sometimes employed. The following substances have been reported as adulterants of pepper by various authors: Mustard-seed cake, flaxseed-meal cake, poppy-seed-meal cake, grape seeds, exhausted coriander fruit and paradise grains.

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[13] A. Bertschinger: *Schweiz. Wochenschr. Chem. Pharm.*, **39** (1901), pp. 215–216; Abstract in *Zeitschr. f. Untersuchung d. Nahr.-u. Genussmittel*, **4** (1901), p. 782.

SOME TESTS FOR GURJUN BALSAM IN COPAIBA.

By Charles E. Vanderkleed.

Publicity as to the nature of an adulteration has in many cases been the only thing necessary to put a stop to the practice,—not so in the case of adulteration of copaiba with Gurjun balsam, however, for although that practice is very old and the knowledge that copaiba has been very extensively adulterated with Gurjun balsam is well-known to every one, the practice has been continued up to

the present day, as the adulterators have rested secure in the knowledge that the methods used for the detection of Gurjun balsam in copaiba have not been satisfactory and could not be depended upon to give accurate results. Attempts to solve the difficulty of providing suitable tests for the detection of Gurjun balsam go back a great many years—one test after another has been proposed, used for a time, and then been abandoned—and so to-day we have two or three tests, or modifications of old tests, that have been proposed during the past year, and which are now undergoing a period of probation. It remains to be seen whether or not they will stand or fall.

My coming before you to-day is therefore more in the nature of a discussion of what has already been done, than of an offer of anything new on the subject. I wish simply to make for you a few of the most recently proposed tests as compared with similar tests which preceded them, in order that all chemists reached by this meeting, who are working with copaiba, may be induced to try the tests, so that when the Pharmacopœia is next revised we may have an accumulation of evidence and data to submit to the revision committee to help them in their work.

The earliest official test for Gurjun balsam in copaiba is found in the U.S.P. of 1880, which test was continued unchanged in the U.S.P. of 1890.

This test consisted in adding to 20 drops of a 5 per cent. solution of copaiba in carbon disulphide, one drop of a mixture of nitric and sulphuric acids, when a purplish red or violet color, due to the oxidizing action of the nitric acid on the resins indicated Gurjun balsam. This test, as pointed out by Kebler in the AMERICAN JOURNAL OF PHARMACY about ten years ago (see proceedings A. Ph. A., 1896, page 629), was not sufficiently delicate, although if applied as originally intended (see E. Schmidt's *Pharmaceutische Chemie*, 4th edition, page 1261) to a drop of distillate of highest boiling point from the balsam to be tested, its delicacy is increased. A test involving fractional distillation of the sample, however, is an impractical one for constant use, and so about this time (ten or twelve years ago) there appeared the first of the acetic-nitric acid tests —one modification of which is at present official in the U.S.P. So far as I am able to trace its history, this test first appeared in the *American Druggist and Pharmaceutical Record* of July 10, 1895, as a

contribution from the laboratory of Dodge & Olcott, and the test was made as follows (see proceedings A. Ph. A., 1896, page 628):

Four drops of the sample are dissolved in 15 c.c. of glacial acetic acid, and to the solution is added from 4 to 6 drops of C. P. nitric acid. With pure copaiba, no color, and at most but a slightly cloudy solution results—whereas with pure Gurjun balsam a deep purple color ensues. With mixtures the purple color is supposed to correspond to the extent to which Gurjun balsam has replaced copaiba. According to the authors, as little as 2 per cent. of Gurjun balsam can be detected. My experience with the test indicates that it is really the most satisfactory of the old modifications of the test, but time is required for the development of the color if only small amounts of Gurjun balsam be present.

I will proceed to demonstrate the test, using a pure balsam copaiba and pure Gurjun balsam as well as mixtures of the two in varying proportions. Every precaution has been taken to insure the purity of the balsam copaiba used. The sample answers all the U.S.P. tests for purity, has a specific gravity of 0·984 at 22° C., leaves a residue of 53 per cent. when heated for 48 hours on a water bath, and requires 2½ c.c. of N / 2 alcoholic potassium hydroxide solution for each gram, indicating the proper proportion of acid resin. The Gurjun balsam has a specific gravity of 0.96 at 22° C., and was further distinguished from the similar Chinese wood oil by means of the Elaidin reaction. A time limit of six hours or overnight should have been added to this test, but time-limit tests are inconvenient in many ways, and when the eighth revision of the U.S.P. appeared it was found to contain a modification of this test as advocated by Kebler (see proceedings A. Ph. A., 1896, page 629.)

This test consisted in mixing four drops of nitric acid with one c.c. of glacial acetic acid and adding four drops of the sample—first as an upper layer—when no reddish zone should appear. Further on mixing the layers by shaking, no red or purple color should ensue. No time-limit was set for the development of the color.

The Revision Committee was soon informed that this test was not satisfactory since with this strength of nitric acid used, (about fifteen times that of the original D. & O. test) pure copaiba gives a dark-brown coloration which obscures the red or purple color of the Gurjun balsam reaction so as to render it very uncer-

tain with solutions containing as high as 30 or 40 per cent. of the adulterant. I will proceed to show this test with pure balsam copaiba and with the mixtures as before.

Realizing that the entire acid mixture was too strong, the test was changed with the issue of Additions and Corrections of May 1, 1907, the amount of nitric acid being cut from four drops to one drop, and the acetic acid being increased from 1 c.c. to 3 c.c.'s. This decreased the strength of nitric acid used by twelve-fold and approximated the strength used in the original D. and O. method; but the contact method of applying the test was retained, and so with even this improvement, the present official test remains uncertain.

I have been informed on good authority that chemists in certain customhouse laboratories have stated that they cannot apply the test with accuracy to balsams containing less than 30 per cent. of Gurjun Balsam.

In a paper read before the Pennsylvania Pharmaceutical Association last June, at Bedford Springs, I suggested the following modification of this test, which I will endeavor to demonstrate.

Four drops of the sample are dissolved in 3 c.c. of glacial acetic acid in a small flat-bottomed cylinder. Three or four drops of nitric acid are then added from a pipette in such a way that it mixes but slightly with the solution of the balsam and collects on the bottom in a very thin layer.

Five per cent. seems to be the limit of delicacy of this test with a five-minute time limit. In all these tests greater accuracy is always to be gained by comparing the results with the test made upon a pure sample.

Finally, I wish to show a test which in my laboratory has given the most satisfaction,—a test worked out by Mr. J. L. Turner, and published in the *Pharmaceutische Centralhalle*, volume 48, No. 21, May 23, 1907. The test is also described in my paper above referred to. The test, which I will demonstrate, is as follows:—

Four drops of the sample are dissolved in 3 c.c.'s of glacial acetic acid; one drop of freshly-prepared 10 per cent. aqueous solution of potassium nitrite is added, and the mixture poured carefully on to the surface of 2 c.c. concentrated sulphuric acid. A dark color will always appear at the surface of contact, but in the presence of 2 per cent. or more of Gurjun Balsam a violet color appears in the clear upper layer.

Mr. M. I. Wilbert, in his report on the Progress of Pharmacy (AMERICAN JOURNAL OF PHARMACY, December 1907, page 576) calls attention to the statement of E. J. Parry, that Hardwickia Balsam from *Hardwickia pinnata*, Copaiferae, is being used to adulterate Copaiba (see Schimmel's report for April, 1907). It would be interesting to know whether any of the above tests for Gurjun Balsam would likewise detect this Balsam, but I have not yet had an opportunity to try it.

ANALYTICAL LABORATORY H. K. MULFORD COMPANY.
December 16, 1907.

THE DISTILLATION OF OIL OF CORIANDER.

BY ADOLPH W. MILLER., M. D.

In order to dispose of some Mogador coriander fruit, which had become infested with mites, it was determined to subject it to distillation. This was conducted in a vacuum still, steam being used as the source of heat, at a temperature of 150° F., the pump maintaining a vacuum of twenty inches.

The first charge of forty pounds consisted of about one-third of worm-eaten fruit, and about two-thirds of fruit in good condition, both having been previously crushed. The yield of oil was not appreciable, as is generally the case with drugs whose yield of oil is small, the water of this first distillation merely becoming saturated with the oil.

The second and third charges consisted of forty and thirty pounds respectively of crushed Mogador fruit in fair condition. These were subjected to the same vacuum and temperature, the saturated water of the first distillation being used again. The total yield of oil of coriander thus obtained from these seventy pounds was 890 grains, being equivalent to 0.18 per cent.

This oil, a sample of which is submitted, is readily soluble in three volumes of 70 per cent. alcohol, and is also freely soluble in all proportions of 80 and 90 per cent. alcohol at the temperature of 77° F., in so far complying with the United States Pharmacopœia. Its specific gravity is 0·883 at 77° F. being very near the 0.878 prescribed by the United States Pharmacopœia.

A sample of German oil of coriander just received from a prominent importer of essential oils is also submitted. This does not comply with the requirements of the United States Pharmacopœia in respect to being entirely soluble in three volumes of 70 per cent. alcohol at a temperature of 77° F. Only about 25 per cent. of the oil will dissolve at this temperature. It does, however dissolve, in this menstruum, when the temperature is raised to 80° F. It is also soluble in all proportions of 80 and 90 per cent. alcohol. Its specific gravity is 0.866 at 77° F., being still within the limits of the U.S.P. of 0·863 to 0·878.

As linalool is a normal constituent of oil of coriander, this substance has been sometimes used as an adulterant of the oil, as well as oil of cedarwood and oil of sweet orange.

Samples of oil of linaloe, composed in the main of linalool, and of pure oil of coriander, to which 25 per cent., respectively of oil of sweet orange, and oil of red juniper wood (the so-called oil of cedarwood of commerce) have been purposely added, are submitted. Both of these adulterations are noted in the text-books.

The distillation of the oil, and the chemical and physical examination of the specimens submitted, were conducted by Mr. Ralph R. Opie.

A PHARMACOLOGICAL STUDY OF CANNABIS AMERICANA (CANNABIS SATIVA).[1]

By E. M. Houghton, Ph.C., M.D.,
Junior Director of the Biological Laboratories of Parke, Davis & Co.,
Detroit, Mich.
and H. C. Hamilton, M.S.

Much has been said and written by physicians and pharmacists relative to the activity of *Cannabis Sativa* (Cannabis Indica and Americana). It is generally believed that the American grown drug is practically worthless for therapeutic purposes, and that one must employ the true cannabis from India, in order to obtain physiological activity. The best quality of Indian drug, it is claimed, is that grown especially for medicinal purposes and consists of the flowering tops of the unfertilized female plants, care being taken

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[1] Read before the Scientific Section of the American Pharmaceutical Association, September, 1907.

during the growing of the drug to weed out the male plants. This notion, according to our experience, is based largely upon error, as we have found repeatedly that the Indian drug which contains large quantities of seed is fully as active as the drug which does not contain the seed, provided the seed is removed before it is percolated, and the experiments are based upon a fluid extract or other pharmaceutical product obtained from an equal weight of drug minus the seeds. The seeds themselves do not contain the active principle upon which the therapeutic properties of the plant depend, but may make up a very large percentage of the weight of the drug as it appears on the market.

Several years ago we began a systematic investigation of American grown hemp. Samples were obtained from the following localities and studied:

(1) August, 1905, Mr. Gaumnitz, of the Department of Agriculture, of the University of Minnesota, sent us samples of hemp grown on the college grounds.

(2) 1906. Also supplied by Mr. Gaumnitz.

(3) Grown in Mexico, 1903. Sent in for examination.

(4) " " " 1904.

(5) " " " 1906.

(6) " " Kentucky, 1905.

(7) " " " 1906.

(8) " near Detroit, Mich., 1907.

From these several samples of *Cannabis Americana*, were prepared fluid extracts and solid extracts according to the U.S.P., which were tested upon animals for physiological activity.

The method of assay, which has previously been called to the attention of this society, is that which one of us (Houghton) devised and has employed for the past twelve years. This method consists essentially of the careful observation of the physiological effects produced upon dogs from the internal administration of the preparation of the drug under test, compared with the physiological effects produced by definite doses of a standard preparation of the drug, according to the following method. It is necessary in selecting the test animals to pick out those that are easily susceptible to the action of cannabis, since dogs as well as human beings vary considerably in their reaction to the drug. Also, preliminary tests should be made upon the animals before they are finally selected for test pur-

poses, in order that we may know exactly how they behave under given conditions. After the animals have been finally selected and found to respond to the standard test dose, ·010 per kilo, they are set aside for this particular work, care being taken to have them well fed well housed, and in every way kept under the best sanitary conditions. Usually we have found it desirable to keep two or more of the approved animals on hand at all times, so there may not be delay in testing samples as they come in.

In applying the test, the standard dose is administered internally in a small capsule. The dog's tongue is drawn forward between the teeth with the left hand and the capsule placed on the back part of the tongue with the right hand. The tongue is then quickly released and the capsule swallowed with ease. In order that the drug may be rapidly absorbed, food should be withheld twenty-four hours before the test and an efficient cathartic given, if needed.

Within a comparatively short time, one to two hours, the dog begins to show the characteristic effects of the drug: First a stage of excitability is noticed, followed sooner or later by a condition of incoordination, the animal behaving as though intoxicated. Experience is necessary on the part of the observer to determine just when the physiological effects of the drug begin to manifest themselves, as there is always, as in the case of many chemical tests, a personal factor to be guarded against. The dogs must be kept perfectly quiet and watched without attracting their attention. The influence of the test dose of the unknown drug is carefully compared with the same dose of the standard preparation administered to another test dog at the same time, under the same conditions. Finally, the dogs become sleepy, the observations are recorded and the animals returned to their quarters.

The second day following, the two dogs are reversed, *i. e.*, the animal receiving the test dose of the unknown receives the test dose of the known, and vice versa, and a second observation made. If one desires to make a very accurate quantitative determination, it is advisable to use not two dogs but four or five, and study the effects of the test dose of the unknown in comparison with the test dose of the known upon each. If the unknown is below standard activity, the amount should be increased until the effect produced is the same as for test dose of standard. If the unknown is above strength, the test dose is diminished accordingly. From the dose of

the unknown selected as producing the same action as the test dose of the standard, the amount of dilution or concentration necessary is determined. The degree of accuracy with which the test is carried out will depend largely upon the experience and care exercised by the observer.

It is best to use the dogs on alternate days, in order that they may completely recover from the influence of the drug. Another point to be noted in the use of dogs for standardizing cannabis is that, although they never appear to lose their susceptibility to the drug, the same dogs cannot be used indefinitely for accurate testing. After a time they become so accustomed to the effects of the drug that they refuse to stand on their feet, and so do not show the typical incoordination which is the most characteristic and constant action.

We have never been able to give an animal a sufficient quantity of a U.S.P. or other preparation of the drug to produce death. When study of the drug was first commenced, careful search of the literature on the subject was made to determine its toxicity. Not a single case of fatal poisoning have we been able to find reported although often alarming symptoms may occur. A dog weighing about 25 pounds received an injection of 2 ounces of an active U.S.P. fluid extract in the jugular vein with the expectation that it would certainly be sufficient to kill the animal. To our surprise the animal, after being unconscious for about a day and a half, recovered completely. This dog received not alone the active constituents of the drug but also the amount of alcohol contained in the fluid extract. Another dog received about 7 grammes of S. E. Cannabis with the same result.

There is some variation in the amount of extractive obtained, as would be expected from the varying amount of stems, seeds, etc., in the different samples. Likewise there has been a certain amount of variation in the physiological action, but in every case there has been elicited the characteristic symptoms from the administration of ·010 grammes, per kilo body weight, of the extract.

The repeated tests that we have made have convinced us that the drug, properly grown and cured, is fully as active as the best Indian Cannabis, which we have sometimes found to be practically inert. Previous to the adoption of the physiological test, over twelve years ago, we were often annoyed by complaints of physicians that certain lots of drugs were inert, in fact some hospitals, before accepting

their supplies of hemp preparations, asked for samples in order to make rough tests upon their patients before ordering. Since the adoption of the test we have not had a single report of inactivity, although many tons of the various preparations of *Cannabis Indica* have been tested and supplied for medicinal purposes.

Furthermore, we have placed out quantities of fluid extract and solid extract of *Cannabis Americana* in the hands of experienced clinicians, and from eight of these men, who are all large users of the drug, we have received reports which state that they are unable to determine any therapeutic difference between the *Cannabis Americana* and the *Cannabis Indica.* We are of the opinion that *Cannabis Americana* will be found equally as good, and perhaps better, than that obtained from foreign sources, as proper directions can be given to the grower, in order to produce a drug of the greatest value. We expect to give this phase of the subject especial attention during the next few years, and see what improvements may be effected.

CONCLUSIONS.

(1) The method outlined in the paper for determining the physiological activity of *Cannabis Sativa* by internal administration to especially selected dogs, has been found reliable when the standard dose, ·010 per kilo body weight, is tested in comparison with the same quantity of a standard preparation of known strength.

(2) *Cannabis Sativa,* when grown in various localities of the United States and Mexico, is found to be fully as active as the best imported Indian grown *Cannabis Sativa.*

KEFIR AND ITS PREPARATION.[1]

By I. V S. Stanislaus, B. Sc., Phar. D.

The name "Kefir" is applied to a beverage prepared from cow's milk with the aid of an appropriate ferment called "Kefir grains."

This beverage has been used from time immemorial by the inhabitants of the northern part of the Caucasian Mountains under various names, as kefir, kapir, kifir, kepu and the like.

Kefir is not an imitation of koumys which the Tartars prepare from mare's milk, but differs from the latter as much as does cow's milk differ in its composition from mare's milk.

[1] Read before the Scientific Section of the American Pharmaceutical Association, September, 1907.

The ferment employed for the preparation has the appearance of crumbs or grains of various sizes, cauliflower-like in form. When in the dry condition these possess a yellow to a brick-red color, while in the moist condition they appear whitish in color.

The Kefir grains examined under the microscope appear to be composed of two morphologic forms—yeast cells (*Saccharomyces Cerevisiae Meyen*) and bacteria proper, having the form of cylindrical threads or rods and of their spores which Kerman and Krannhalls called *Dispora Caucasica.*

H. Struve considers the above bacteria as animal fibers, originating from bags made of hide, the so-called "burdiuk" in which kefir is prepared on the Caucasus.

Drs. L. Nencki and A. Fabian, in their work on kefir, discredit the above assertions of Struve as unfounded, claiming in turn that besides the fibers described by him they found the kefir grains to contain Hay bacteria (*Bacillus subtilis*) the so-called mildew grains of the Oidium variety and the bacteria of butter (*Bacillus butyricus.*)

The ferment described above is variously styled by the Tartars thus—"Kefir mildew," "kefir grains," or the "millet-seeds of the Prophet;" in continental Europe as "kefir champignons" or "kefir mushrooms."

The origin of kefir grains is not generally known; the mountain tribes of the Caucasus consider them as of sacred origin and hence the name "millet seeds of the Prophet." This is based on the Oriental legend purporting that the first Mohammed conferred this blessing upon his chosen people.

At the present time the purchase of the grains is possible everywhere—not so twenty years ago. No one of the Caucasian tribesmen dared to offer it for sale or even as a gift, and this not only to the "infidels" but to their own kin as well, because there existed a strong belief that by parting with some of the grains, the remaining grains would lose their fetichic power to ferment.

The legendary custom of parting with the grains, according to a Russian authority, was closely adhered to: The daughter upon being married did not receive her dowry of the grains outright, but upon the first visit her mother would leave her alone in the room where the grains were stored, this as a sign that in her absence the daughter could follow the American custom, "help yourself."

The probability of the origin of the kefir grains Professor Pod-

wysocki, of Riga, explains as follows: The koumys-forming ferment was known in times immemorial as history shows. When, however, the tribes occupied as horse-raisers and traders of the plains were compelled to migrate into the mountains, owing to the different condition of the soil and geographical distribution they were obliged to raise more bovine cattle than horses, which fact caused a shortage of mare's milk. The next step was to add the koumys ferment to a mixture of cow's and mare's milk. As the outgrowth of this in time the koumys ferment acquired a different form and composition, and such we now call "kefir grains."

This theory Professor Podwysocki further augments by the statement that outside of the Caucasus neither in Switzerland nor any other mountainous localities were the cattle-raisers fortunate in arriving at the kefir ferment; and by the fact that the most select koumys can only be prepared from mare's milk when kefir grains are employed, and not with yeast as ordinarily practised.

When Kefir grains are added to cow's milk two kinds of fermentation occur—alcoholic and lactic. Besides this, they peptonize albuminous substances, giving rise to physiologically highly beneficial compounds.

The main components of kefir may be classed as fat, lactose, alcohol, carbondioxid, lactic acid (which should not exceed 0.7 to 1 per cent.), inorganic salts, and albuminous bodies which exist here as casein, albumin, acidalbumin, hemalbumose and peptone.

The comparative analyses of cow's milk and twenty-four hours old kefir prepared therefrom are highly interesting and instructive:

	In parts per hundred.	
	Kefir.	Cow's milk.
Specific gravity at 15·4° C.	1·032	1·030
Total albuminous bodies	4·150	4·080
Casein	2·760	
Albumin	0·680	
Acidalbumin	0·300	
Alcohol	0·490	
Acid lactic	0·520	
Carbondioxid	0·045	traces.
Lactose	2·050	4·923
Fat	traces	3·701
Ash	0·630	0·622
Reaction	Slightly acid.	Slightly alkaline.

The prepared kefir is of a whitish color, pleasant and slightly cooling to the taste.

The quantity of the compounds formed through the so-called "starter" is closely dependent upon the quantity of lactose present in the milk employed and on the quantity of the "starter" added.

It should be stated that after the kefir is complete and ready for use, further changes still occur. Thus, in the preparation twenty-four hours old, hemalbumoses are absent but develop only on the third day, and the same may be said of peptone, which can be detected only after the third day.

There are several methods known for preparing the beverage. Some of these, however, give unsatisfactory results and are unduly tedious, and these I have omitted in this outline.

Before we proceed to the preparation of kefir, the grains should carefully be examined as to their condition, whether healthy or otherwise, and for freedom from adulterants, which is not an uncommon occurrence of late.

Good, healthy grains are recognized by their irregular form and size, hardness and yellow, to a brick-red, color. Macerated in water, they soften, acquire a whitish color, and swell up considerably, becoming rubbery masses branched on one side and almost smooth on the reverse concave side.

Nefarious varieties of the grains which are prepared from bread-crumbs with the addition of brewers' yeast and thus falsified, added to the genuine variety can be readily differentiated from the latter upon maceration with water. When so treated they are devoid of the rubber-like springiness and when rolled between the fingers become dough-like. When treated with a solution of iodine they acquire the characteristic blue color.

Having assured ourselves of the quality of the grains, we begin with the preparation of the "starter." This is done by macerating them in warm water for twenty-four hours, changing the latter at least four times. The well soaked grains are next separated from the water by straining, and in the proportion of two tablespoonfuls for every one and a half glasses of milk (350 c.c.) are added to the latter.

The vessel containing the mixture of the grains and milk is covered with muslin and set in a warm place at 15° C. to 18° C. until the grains begin to float upon the surface. It should be

remembered that the mixture requires occasional stirring during the first few hours.

The grains can be separated and used in the preparation of several lots.

When used for the first time the grains begin to float, but very slowly, sometimes requiring from three to eight hours and occasionally even more. But when they are used repeatedly for preparing kefir without intermediate drying, they float to the surface after three to four hours.

After a quantity of the grains rise to the surface, the mixture is strained, when a liquid is obtained which is called the "starter." The grains can now be covered with milk and set aside in a cool place until the next day.

"The "starter" prepared as above is mixed with three-quarters of a glass (188 c.c.) of previously boiled milk agitated thoroughly and poured into a clean bottle, which, however, should not be filled completely, corked immediately and securely, and set aside at a temperature of 20° to 23° C., until it begins to thicken, which process requires from eighteen to twenty-five hours in the winter, and from fourteen to twenty hours in the summer. The mixture acquires the consistency of cream, which can readily be seen through the walls of the bottle. The thickened mixture is now agitated vigorously, laid upon the side in a cool place (preferably the cellar where the temperature should not exceed 9° to 12·5° C. and agitated every two hours.

Kefir prepared as above is called "day-old," and is the weakest. It contains a slight quantity of CO_2, is viscous, possessing a very pleasant, refreshing and slightly acid taste. It should not contain "cheesy masses."

If allowed to rest in the cellar for a longer period the "two day-old" and "three-day-old" are respectively obtained. But it should always be remembered that the contents be thoroughly shaken at least once every three hours.

We have stated above that the grains after being used are covered with milk and set aside until the next day. These, now carefully washed with water, can be used further to obtain new quantities of kefir by covering them with one and a half glasses of milk and repeating the operation as above.

The first lots of kefir are usually of inferior quality; the longer the grains are used the better the product. It should be remem-

bered that the grains must be thoroughly and carefully washed in cold, distilled water from the deposit of curd which accumulates upon their surface, causing subsequent acid fermentation which is highly detrimental to their quality and fermentative power.

Second Method: Kefir may be prepared by taking a tablespoonful of the dry grains, covering them with warm water and changing the latter several times during twenty-four hours. Next the grains are daily covered with fresh milk until they become "springy." The so-prepared grains are placed in a decanter covered with three glasses (750 c.c.) of milk and agitated frequently during six to eight hours. The grains are now strained off, the colate placed in bottles which should not be filled too full—and these latter are proceeded with as described in the first method.

Third Method: This method depends upon the employment of "three-day-old" kefir. Thus the contents of a bottle of the latter is divided equally into three bottles, these are filled within an inch of the top with cold, previously boiled milk, corked securely, agitated occasionally at the room temperature during three days or until the mixture thickens, when one of the bottles is again divided into three fresh bottles and proceeded with as above. This method has one disadvantage in that the third and the fourth attenuations spoil quickly.

The following points should be observed in the preparation of kefir: The milk should be fresh, previously skimmed and boiled; the latter condition is imperative to prevent butyric fermentation. It is also advantageous to sometimes add a teaspoonful of lactose to the milk, as in this wise more alcohol and CO_2 is formed and the albuminous bodies undergo peptonization much more readily. Good kefir should be homogeneous, viscous fluid not readily separating into two layers. Ferrated kefir for anæmics is prepared by adding to each bottle 0·1 gramme of ferric lactate. Pepsinated kefir is made by adding 0·75 gramme of powdered pepsin to each bottle.

THE EVIL INFLUENCE OF MYSTERY IN THERAPEUTIC AGENTS UPON THE SCIENCE OF MEDICINE.

By J. H. Musser,, M.D., Philadelphia.

The high level of present-day medicine has been attained by a process of gradual growth secured only by daily valuation of the facts in biology, whereby those of seeming truthfulness were cast aside, and those of truth fastened upon as with hooks of steel.

No scientific groupings of any biological truths can be made in which falsehood and truth are intermingled. The Science of Medicine rests upon biological laws which are as immutable as those of physics or of mathematics. The prosecution of the study of medicine and, I may also say of the art of medicine, can be conducted only by methods, which the scientific habit of mind can employ. Accurate observation, logical deduction and precise action mark the efforts of the scientific physician. True inference can follow only upon observations which attain the truth. If, therefore, it is essential in the first steps of our art—in diagnosis—to seek and to accept the truth only, how is it possible we can succeed in the practical application of the science, if we depart from truth and take as our handmaids, mystery, and falsehood in therapeutic action? If precision and accuracy are required in diagnosis, why are they not essential in therapeutics? To employ agencies, the composition of which is a mystery, is as much a method of the dark ages as to employ witchcraft, magic and other methods of that era. We must all admit that empirical treatment is a mode that had to be employed in the past. Happily, the day is rapidly coming, when the problems of the action of some remedies, as for example, of Iodide of Potassium in syphilis will be solved. Nevertheless, the use of this remedy, of Quinine in malaria, of Lemon juice in scurvy, was based on scientific inference. How can it be possible to draw such inference, when combinations of remedies made without regard to the traits and characteristics of individuals, are employed willy-nilly, for the treatment of disease? Even if we knew the composition of the various nostrums, how can we employ them when we admit our great advance in therapeutic action is dependent upon the broad principle that we treat the patient who is ill and not the disease? When, therefore, I am handed this combination for one disease; another for another, and so along the whole list I have the right to

say, I do not pretend to treat or cure any disease. My effort is to safeguard the individual, to see that there is no departure from the biological laws which control his life or to correct such as may exist, and to aid and abet the physiological processes by which the organism defends, resists, or adapts itself in that departure from the normal, in function or structure, which we call disease. Have we under these circumstances any use for mysterious agents?

The greater harm in the use of these agents is in their retro-active effect. That state of mind, which permits itself to be subordinated to those who think for them, will silently but surely lessen in vigor and virulence. That success in medicine which alone is self satisfying, which grows with the possessor's growth in power, which reaches its acme with his maturity, and continues in the fulness of his power, is only attained by a scientific habit of mind. Precise observation and true inference, truth sought and it alone retained as of value, belong to this habit. Any acceptance of the false, any compromise with mystery will surely impair it. In scientific labors one must constantly be "girding up the loins;" a high standard must always obtain. It is most easy, from perhaps fatigue, from stress of work, from eagerness to indulge in the pleasures of the day, to lapse. How hard it is for one to compel himself, not to make a "snap" diagnosis! Just as a snap diagnosis is vicious in its effects on the faculties of observation and the processes of reasoning, so is a "snap" therapeusis in its effects on the art of treatment. Any slipshod method of action begets its kind and soon in diagnosis and treatment a charlatanism arises, worse even than that of the ignorant quack or the credulous enthusiast in therapy.

The profession should take a stand for its own sake against haphazard, trivial, unscientific prescribing, which dwarfs the mind of the actor and later the conscience, far more frequently than it does harm to the victim of such conscienceless procedures. It is too often one of the seductive agents which leads the poor fellow who has attained a success, which is but a "flash in the pan." Nostrum prescribing as tallow on the ways, launches the physician into the seething sea of irresolution in diagnosis and irresponsibility in practice. To such a one success has come early, in part from fortuitous circumstances, or in part from a fortunate personality (another snare for many) and does not have for its foundation, the power which comes from labor in the laboratory and hospital ward,

and with the midnight oil of the library. A stronger Junior comes along and the success of the other is challenged; it fades and the struggle for its continuance leads the fading power to grasp at the many "will-o' the-wisp," political, social, religious, lodge and other vicarious methods of support. Such are among the men who are the nostrum prescribers of the profession. Had they pored over their labors and planned therapeutic campaigns on proper lines and not by slipshod methods, their success would never have been threatened; snap diagnosis and snap therapeutics would not have been of their stock in trade.

The profession ought to know that the public are wiser than they realize, and that some day the worm may turn and pour its vials of wrath upon the irresponsible and reckless, who without conscience, empty ad nauseam vial upon vial of unknown ingredients down credulous throats. It is to save us from this fate that the altruistic of our profession, Simmons, Billings, Cohen,—Professor Remington and Wilbert, and his colleagues are laboring. Let us bid them God speed in their efforts, and take heed.

Let me venture one prediction:—if pharmacists and physicians alike do not have a care, the day will come when pharmaco-therapy somewhat effaced at present will, if it has not already, give way to physiologic and psychic therapeutics.

Finally, it can never be said better than it was said by Emerson: "what a man does unto others, he does unto himself. If he does not play fair with others, he plays false to himself."

PROPRIETARY PREPARATIONS APPROVED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION.

(*Continued from page 432, Vol. 79.*)

GUAJASANOL.—DIETHYLGLYCOCOLL-GUAIACOL HYDROCHLORIDE.

Guajasanol, $C_6H_4(OCH_3).(CH_2N(C_2H_5)_2.COO).HCl = C_{13}H_{19}NO_3HCl$, is the hydrochloride of diethylglycocoll-guaiacol.

Actions and Uses.—It is antiseptic and anesthetic. It is readily absorbed and splits off guaiacol in the organism with marked facility. Its antiseptic power is said to be about equivalent to that of boric

acid. Guajasanol has been recommended for the treatment of tuberculosis, both internally and subcutaneously. It is also recommended as a deodorant and is said to have given good service in putrid cystitis. Dosage.—1 to 3 grammes (15 to 45 grains) in wafers; subcutaneously, 3 to 4 grammes (45 to 60 grains) in 20 per cent. aqueous solution; locally it may be used in from 0·1 to 2 per cent solutions. Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York). U. S. patent No. 624,722.

HEDONAL.—METHYLPROPYLCARBINOL URETHANE. PENTAN-2-OL-URETHANE.

Hedonal, $CH_3.CH_2.CH_2.CH(CH_3)O.CO.NH_2 = C_6H_{13}O_2N$, is a urethane differing from ethyl carbamate, U.S.P., in that the ethyl radicle has been replaced by the radicle of methylpropylcarbinol (pentan-2-ol). $CH_3.CH_2.CH_2.CHOH.CH_3$.

Actions and Uses.—Hedonal appears to have a greater hypnotic effect than ethyl carbamate. It is said to be followed by no after-effects and is oxidized in the body to urea and carbon dioxide. It is recommended in insomnia due to mental overwork or nervous excitement occurring in the course of neurasthenia or hysteria. It is claimed to be particularly useful preliminary to anesthesia, a hypnotic dose being given and anesthesia effected with chloroform after the patient has been asleep for an hour. Dosage.—1 to 2 grammes (15 to 30 grains), administered dry, followed by a swallow of water, or in wafers or capsules. Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color and Chemical Co., New York). U. S. patent No. 659,202; German patents Nos. 11,496, 120,863, 120,864, 120,865.

HELMITOL.

A name applied to Hexamethylenamine Methylencitrate (which see).

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color and Chemical Co., New York). U. S. patent. U. S. trade-mark No. 39,580.

HEROIN.—DIACETYL-MORPHINE.

Heroin, $C_{17}H_{17}(C_2H_3O_2)_2NO = C_{21}H_{23}O_5N$, is a synthetic alkaloid obtained by the acetylization of morphine.

Action, Uses and Dosage.—See heroin hydrochloride. Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color and Chemical Co., New York). U. S. trade-mark.

HEROIN HYDROCHLORIDE.—DIACETYL-MORPHIN HYDROCHLORIDE.

Actions and Uses.—When given in small doses, heroin hydrochloride has apparently no effect on any of the vital functions except respiration, which it renders slower, the volume of the individual respirations being increased, but usually not sufficiently to compensate the slowing, the result being a diminution in the total amount of air respired. In large doses it may produce dizziness, nausea and occasionally constipation, and, in poisonous amounts, twitching of the extremities, great exhaustion, and dimness of vision may be added. The temperature becomes subnormal and the pulse rapid and thready. The habit is readily formed and leads to the most deplorable results. It is said not to produce costiveness. (This is not true, according to some observers.) It is readily absorbed from all mucous membranes. It lessens irritability of the respiratory center, thus allaying cough, but does not depress the respiration as much as morphine. On withdrawing the drug from habitués, there is said to be a tendency to respiratory failure which may be dangerous. Heroin and its hydrochloride are recommended chiefly for the treatment of diseases of the air passages attended with cough, difficult breathing and spasm, such as the different forms of bronchitis, pneumonia, consumption, asthma, whooping cough, laryngitis and certain forms of hay fever. It has also been recommended as an analgesic, in the place of morphine in various painful affections. Toxic symptoms should be treated by the administration of caffeine hypodermically and of hot coffee by the stomach. To avoid respiratory failure in the treatment of heroin addiction, it has been suggested to substitute morphine for the heroin and then treat the patient for morphine additions. Dosage.—0.0025 to 0.005 gramme ($\frac{1}{24}$ to $\frac{1}{12}$ grain) to adults 3 to 4 times a day, the maximum dose being 0.01 gramme $\frac{1}{6}$ grain. To children it may be given in doses varying from 0.0002 to 0.001 gramme ($\frac{1}{300}$ to $\frac{1}{60}$ grain), according to the age. Hypodermically it may be administered in the form of a 2 per cent. solution in the same doses. It has been applied locally to the throat, to the

uterus on tampons, and by suppository for painful pelvic affections generally; but there is no evidence that it produces any local anesthetic action. Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color and Chemical Co., New York). U. S. trade-mark.

HEXAMETHYLENAMINE METHYLENCITRATE.[1]

This substance, $C_6H_8O_7(CH_2)_6N_4 = C_{12}H_{20}O_7N_4$, is a compound of hexamethylenamine with anhydromethylencitric acid.

Actions and Uses.—It is a urinary antiseptic and germicide claimed to be more prompt and energetic in its action then hexamethylenamine, acting equally well whether the urine be alkaline or acid in reaction, rapidly clearing it up and allaying pain. It is recommended in cystitis, pyelitis, prostatic diseases and urethritis. It is also recommended as an efficient urinary antiseptic in infectious diseases in which bacteria are present in the urine, as in typhoid fever. It is regarded as a useful urinary antiseptic in the later stages and chronic forms of gonorrhœa. It may be used as a prophylactic against infection in case of operations or instrumental manipulation of the genitourinary tract. Dosage.—0.6 to 1 gramme (10 to 15 grains).

HOLOCAINE HYDROCHLORIDE.—ETHENYL-PARADIETHOXY-DIPHENYL-AMIDINE HYDROCHLORIDE.

Holocaine hydrochloride, $CH_3.C(:N.C_6H_4.OC_2H_5)(.NH.C_6H_4OC_2H_5).HCl = C_{18}H_{22}N_2O_2.HCl$, is the hydrochloride of a basic condensation product of paraphenetidin and acetparaphenetidin (phenacetin).

Actions and Uses.—It is a local anesthetic like cocaine, but having the advantage of quicker effect and an antiseptic action. Five minims of a 1 per cent. solution when instilled into the eye are usually sufficient to cause anesthesia in from 1 to 10 minutes. It is more toxic than cocaine and without effect on the pupil or blood vessels. It is not so useful as cocaine when the vaso-constrictor effect of the latter is desired. It is said not to cause the scaliness of the cornea which sometimes results after the use of the older remedy. Dosage.—It is applied in a 1 per cent. aqueous solution

[1] This is the chemical name for a preparation on the market under the names of helmitol and urotropin, new.

prepared in porcelain vessels. Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York). German patents Nos. 79,868, 80,568.

ICHTHALBIN.—ICHTHYOL ALBUMINATE.

A compound of ichthyolsulphonic acid and albumin analogous to tannalbumin.

Actions and Uses.—Its actions and uses are the same as those of ichthyol, with the asserted advantage of freedom from such side effects as nausea, eructations, etc. It is recommended for the same purposes as ichthyol. Dosage.—For infants, 0·13 to 0·3 gramme (2 to 5 grains), in gruel; older children, 0·6 to 1 gramme (10 to 15 grains), mixed with scraped chocolate; adults, 1 to 1·3 gramme (15 to 20 grains), in chocolate tablets. Manufactured by Knoll & Co., Ludwigshafen, a. Rh. and New York. English patent No. 11,344. U. S. trade-mark No. 31,114.

NOTES ON ESSENTIAL OILS.[1]

AMERICAN PHARMACOPŒIA (U. S. P.)

On the part of the American Pharmacopœia Committee, Supplements to the U. S. P. have been published on May 1 and June 1, 1907, which contain partly corrections of various statements, and partly additions to the individual articles. In the case of the essential oils, various alterations have also been made, but unfortunately not to such an extent as in our opinion appeared desirable. We quote the various data below without comment, as all further particulars are found in our previous discussion of the Pharmacopœia[2] to which we here beg to refer.

Anise Oil.—$d_{25°}$ 0·975 to 0·988; $a_{D\,25°}$ to — 2°.

Caraway Oil.—$d_{25°}$ 0·900 to 0·910.

Copaiba Oil.—The requirement of solubility has been cancelled.

Erigeron Oil.[3]—$a_{D\,25°}$ not below + 45°.

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[1] From the Semi-annual Report of Schimmel & Co., October, 1907.

[2] Comp. Report, April 1906, 69. AM. JOUR. PHARM., 78 (1906), p. 253.

[3] It should be mentioned here still that in recent times we have had to deal repeatedly with authentic erigeron oils, which had a distinctly higher specific gravity than that allowed by the American Pharmacopœia. The specific gravities of the oils in question amounted up to 0·887 at $\frac{15°}{15°}$ corresponding to 0·881 at $\frac{25°}{25°}$.

Eucalyptol.—$d_{25°}$ 0·921 to 0·923.

Eugenol.—$d_{25°}$ 1·066 to 1·068.

Oil of Juniper Berries.—The requirement of solubility is left out.

Lavender Oil.—$d_{25°}$ 0·875 to 0·910.

Lemon Oil.—$a_{D\ 25°}$ not below + 58°.

Nutmeg Oil.—$d_{25°}$ 0·884 to 0·924. The requirement of rotation has been left out.

Peppermint Oil.—$a_{D\ 25°}$ — 20° to — 33°; ester content (menthyl acetate) at least 6 per cent.

Pimenta Oil.—$d_{25°}$ 1·028 to 1·048.

Rosemary Oil.—Ester-content (bornyl acetate) at least 2·5 per cent.; total borneol at least 10 per cent.

Safrol.—$d_{25°}$ 1·098 to 1·100.

Sandalwood Oil. $d_{25°}$ 0·965 to 0·980.

Sassafras Oil.—Special requirements of solubility exist no longer.

Thyme Oil.—Colorless or reddish.

Wormseed Oil, American.—Requirements of specific gravity, rotation, and solubility have been cancelled.

DANISH PHARMACOPŒIA (PHARMACOPŒIA DANICA, 1907).

A new edition of the Danish pharmacopœia has now also made its appearance, a fact which induces us to discuss here the articles dealing with essential oils in a like manner as in a case of the other pharmacopœias of which, up to now, new editions have been published.

As compared with the old Pharmacopœia danica, 1893, no additional directions for testing have been given, so that generally only the color, odor, specific gravity, and solubility are taken into consideration. On the other hand, a whole number of erroneous statements in the old Pharmacopœia have been corrected, and the requirements specified by the new edition may be characterized almost without exception as being to the point.

No oil has been newly added, but several oils hitherto official are now no longer included, for example bergamot oil, cajeput oil, cassia oil, oil of juniper berries, mace oil, oil of sweet marjoram, mustard oil, and crude oil of turpentine.

The alcohols which come under consideration for testing the oils, are alcohol (Vinaand, Spiritus concentratus) with 90 to 91 per cent.

by volume, and dilute alcohol (Fortyndet Vinaand, Spiritus dilutus) with 68 to 70 per cent. by volume.

The individual oils may now follow:—

Anise Oil. (*Aetheroleum anisi*).—At low temperatures, a white crystalline mass, which commences to melt at 15°, and at about 20° represents a colorless or faintly yellowish, strongly refractive liquid; $d_{15°}$ 0.980 to 0.990[1]; soluble in 1.5 to 5 volumes alcohol.

Clove Oil (*Aetheroleum caryophilli*).—In the fresh state bright yellow, in the course of time acquiring a brownish color; $d_{15°}$ 1.045 to 1.070; soluble in 2 volumes dilute alcohol.

Fennel Oil (*Aetheroleum foeniculi*).—Colorless or faintly yellow; $d_{15°}$ 0.965 to 0.975; soluble in an equal volume alcohol; when cooled to about + 5°, it should solidify to a crystalline mass.[2]

Lavender Oil (*Aetheroleum lavandulae*).—Light yellow or greenish yellow; $d_{15°}$ 0.885 to 0.895; soluble in every proportion in alcohol, and in 3 volumes dilute alcohol.

Lemon Oil (*Aetheroleum citri*).—Light yellow; $d_{15°}$ 0.859 to 0.861;[3] with 5 volumes alcohol it forms a not quite clear solution; lemon oil must not show a strong acid reaction.

Menthol (*Mentholum*).—Colorless, brittle, needle-shaped crystals, not moist. M. p. 43°[4]; b. p. 212°[5]; only very slightly soluble in water; very readily soluble in alcohol, ether, chloroform, and fatty oils. When heated in an open dish on a water-bath, menthol should evaporate completely.

Oil of Parsley Seed (*Aetheroleum petroselini*).—Viscid, yellowish to brownish yellow; $d^{15°}$ 1.050 to 1.100; soluble in an equal volume alcohol.

Peppermint Oil (*Aetheroleum menthae piperitae*). Colorless, yellowish or greenish yellow; $d^{15°}$ 0.900 to 0.920[6]; at 20° soluble in

[1] It is recommended to determine the specific gravity at 20°, as anise oil sometimes solidifies already spontaneously at 15°; the above limits of value also apply to 20°.

[2] Solidification must sometimes be started by inoculation with a small quantity of solid anethol, as under certain conditions fennel oil may be cooled much below its solidification point without actually solidifying.

[3] It would have been better to have given 0.857 as lower limit of value.

[4] The m. p. of menthol, taken exactly, lies between 43.5 and 44.5°.

[5] Menthol boils about 217° if the mercury thread of the thermometer is entirely placed in the steam.

[6] According to the specific gravity, both English and American oils are allowed.

3 to 5 volumes dilute alcohol; when more solvent is added, at most a slight cloudiness may occur.

Rose Oil (*Aetheroleum rosae*). Light yellow, sometimes greenish yellow and fairly viscid. At a temperature below 18 to 21°, pointed or laminated crystals separate out from the oil, and if cooled further, the oil solidifies completely; $d^{20°}$ 0·855 to 0·870; only partly soluble in alcohol.

Rosemary Oil (*Aetheroleum rosmarini*). Colorless, or yellowish to greenish yellow; $d_{15°}$ 0·900 to 0·920; soluble in 0·5 and more volume alcohol.

Sandal Oil, East Indian (*Aetheroleum santali*).—Fairly viscid; light yellow to yellow; $d_{15°}$ 0·975 to 0·990[1]. at 20° soluble in 5 volumes dilute alcohol, the solution must also remain clear if more alcohol is added.

Thyme Oil (*Aetheroleum thymi*).—Colorless or yellowish, subsequently red-yellow; $d_{15°}$ 0·900 to 0·930; soluble in half its volume alcohol.

Thymol (*Thymolum*).—Colorless, transparent crystals; m. p. 51 to 52°[2]; b. p. 228 to 230°[3]; completely volatile at the temperature of the water-bath. Molten thymol floats on water, crystallized thymol sinks in it. Soluble in 1100 volume water, very readily in alcohol, ether, and chloroform, also in 2 volume caustic soda liquor (containing 10 per cent. NaOH). Identity reactions and test for carbolic acid.

Turpentine Oil, purified (*Aetheroleum terebinthinae.*) Colorless; $d_{15°}$ 0·860 to 0·870; soluble in about 10 volume alcohol. If the oil is shaken with an equal volume water, the latter must not take an acid reaction; 10 cc. oil, when evaporated on a water-bath, may leave behind only a trace of solid residue.

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[1] The upper limit of value of the specific gravity is given too low; it should be 0·985.

[2] The melting point lies between 50·5 and 51·5°.

[3] Thymol boils between 233 and 234°, if the mercury thread of the thermometer is placed entirely in the steam.

BOOK REVIEWS.

THE INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE. By Charles E. de M. Sajous. Volume II. With 25 illustrations. Philadelphia: F. A. Davis Company. 1907.

This work is a contribution of pathological biology to normal biology. It is a refreshing contribution to the development of scientific medicine. By taking cognizance of the researches in botany, zoology, biology and physiology, as well as medicine, the author shows the efficiency of our therapeutic resources. He has, as a result of an immense amount of work, shown the true relation and influence of medicines on the cardinal functions of organs.

In this volume Dr. Sajous "aims to replace the empirical and hazardous use of remedies which has undermined increasingly the confidence of our best observers in them, by a system of therapeutics based on solidly established facts which make it possible to trace every phase of their action to its source. The centers influenced may thus be used by the physician as so many levers through which he can regulate the defensive agencies of the organism and the mechanisms which distribute them, precisely as a general can give the defensive movements of an army in the field. As the disease-causing substances, toxins, endotoxins, toxic wastes, etc., are also shown to produce their effects through a morbid action upon the centers influenced by our remedies, they may thus be met directly where they strike and antagonized before they can destroy life."

In this volume are considered: (a) the secretion of the adrenals in respiration; (b) the adrenal active principle as the ferment of ferments; (c) the adrenal active principle as the dynamic element of life and the granulations of leucocytes as the living substance; (d) the pituitary body as governing center of vital functions; (e) the leucocytes, pituitary, thyroid, parathyroids and adrenals as the fundamental organs in pathogenesis, immunity and therapeutics; (f) the internal secretions in their relations to pharmacodynamics; (g) the internal secretions in their relations to pathogenesis and therapeutics. Then follows a treatment of poisoning as interpreted from the standpoint of the views advanced in the present work. In a supplement is given a list of the diseases in which the adrenal system and the nerve centers of the pituitary body play a leading part.

THE MICROSCOPY OF TECHNICAL PRODUCTS. By T. F. Hanausek. Revised by the author and translated by Andrew L. Winton with the collaboration of Kate G. Barber. With 276 illustrations. 8vo., xii and 471 pages, 276 figures. Cloth, $5. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1907.

It is very fortunate for American students of technical products that Dr. Winton and Dr. Barber have taken the pains to translate the valuable text-book of Hanausek. The translation has been carried out with the cordial co-operation of the author. "Much new matter has been added to the chapters on textile fibers, and the number of practical examples increased from eight to eighteen. The analytical key for woods has been revised so as to include the most important North American species." A number of cuts in the German edition have been dropped but nearly fifty other illustrations have been added.

The work consists of the following chapters: 1, The Microscope; 2, Microscopic Accessories; 3, Microtechnique and Reagents; 4, Starch and Inulin; 5, Vegetable Fibers and the Microscopic Examination of Paper; 6, Animal Fibers, Mineral Fibers and Textiles; 7, Wood of Dicotyledons and Gymnosperms, Monocotyledonous Stems, Subterranean Organs and Barks; 8, Leaves; 9, Insect Powder; 10, Fruits and Seeds, including Oil Cakes; 11, Teeth, Bone, horn, etc.; 12, Microchemical Analysis.

The work is creditable to the authors and is welcome to analysts and students of technical products. It is a reliable, scientific guide to the student and of great value to the investigator of raw materials.

PLANT ANATOMY, from the standpoint of the development of functions of the tissues and handbook of micro-technique. By William Chase Stevens. With 136 illustrations. Philadelphia; P. Blakiston's Son & Co. 1907.

As stated by the author "the book attempts to point out in a brief and elementary way how plants arrive at this achievement by the evolution of the different physiological tissue systems from a primitive undifferentiated embryonic tissue, and how the tissue systems are adapted by their character and relation to each other to carry out the plant's vegetative functions."

A very good idea of the subjects treated may be had from the titles of the seventeen chapters: 1, The Plant Cell; 2. Differentia-

tion of the Tissues; 3, Secondary Increase in Thickness; 4, Protection from Injuries and Loss of Water; 5, The Plant Skeleton; 6, The Absorption of Water and Minerals; 7, Circulation of Water and Soil Solutes; 8, Intake and Circulation of Gases; 9, Construction of the Plant's Food; 10, Circulation of Foods throughout the Plants; 11, Storage of Food and Water; 12, Secretion and Excretion; 13, The Preparation of Sections; 14, The Use of the Microscope; 15, Reagents and Processes; 16, Microchemistry of Plant Products; and 17, Detection of Adulteration in Foods and Drugs.

It is a good book of fundamental principles in plant anatomy and will be found valuable to the student who is desirious of preparing himself for the study of drugs, foods and technical products. Indeed, the course of work, as outlined in this volume, is required for the microscopical examination of commercial vegetable products.

AN INTRODUCTION TO VEGETABLE PHYSIOLOGY. By J. Reynolds Green. Second edition. Philadelphia: P. Blakiston's Son & Co. 1907. $3.00 net.

This work has apparently been prepared as a companion to the one on "Plant Anatomy," by Stevens. It is an excellent book on elementary vegetable physiology. The following subjects are treated: 1, the general structure of plants; 2, the differentiation of the plant body; 3, the skeleton of the plant; 4, the relation of water to the protoplasm of the cells; 5, the transport of water in the plant; 6, the transpiration current, root pressure and transpiration; 7, the aeration of plants; 8, the food of plants; 9, absorption of food materials by a green plant; 10, the chlorophyl apparatus; 11, the construction of proteins; 12, the constituents of the ash of plants; 13, other methods of obtaining food; 14, translocation of nutritive materials; 15, the storage of reserve materials; 16, digestion of reserve materials; 17, metabolism; 18, the energy of the plant; 19, growth; 20, temperature and its conditions; 21, the influence of the environment on plants; 22, the properties of vegetable protoplasm; 23, stimulation and its results; 24, the nervous mechanism of plants; and 25, reproduction.

The work contains nearly 200 illustrations, is well written and can be used not only by students of botany, but by the general reader who wishes to be informed on the physiological processes in plants.

ASSAYING ERRORS.

When the Manufacturers' Committee, called together by the Pure Food and Drug Act Commissioners, met in New York, September, 1907, we called attention to the fact that certain conditions, likely to make errors in returns, might be met when certain preparations on the market were assayed, one of these being a change in alcoholic strength, *without any evaporation of alcohol whatever*, which would take place in securely sealed containers. Our experience in a study of "*Precipitates in Fluid Extracts*," thirty years ago, had brought to our attention the fact that whenever an alcoholic liquid casts a precipitate, the liquid becomes stronger in its percentage of alcohol. Consequently, a fluid extract that contains 50 per cent. alcohol when freshly made, and which throws out a sediment, will assay above 50 per cent. after precipitation. The alcoholic proportion increases with the amount of the precipitate that separates. In order to establish the result of precipitation, a number of resin-bearing liquids of known alcoholic strength were recently mixed with their own bulk of water, the sediments allowed to separate, and the overlying liquids then assayed, the result being multiplied by two in order to bring them back to the proper proportion, they being now only half the strength of the original liquids. In each instance there was a decided increase in the proportion of alcohol, as shown in the accompanying table.

Name.	Freshly Assayed.	After Precipitation has Occurred.
	Per cent.	Per cent.
Podophyllum	53	65
Eriodyction	77	86
Leptandra	61	62
Jalap	83	98
Grindelia	83	90
Cimcifuga	68	70
Hydrastis	71	72

This is one of the features that will be investigated carefully by the Government, and proper allowance made therefor. We take it, no dealer or manufacturer need expect prosecution by reason of an occurrence indicated by such problems as this.—JOHN URI LLOYD, *Eclectic Medical Gleaner*, Vol. III (1897), No. 6, p. 505.

CONFERENCE OF PHARMACEUTICAL FACULTIES.

Synopsis of the meetings of the American Conference of Pharmaceutical Faculties, held at Hotel Astor, Wednesday and Thursday evenings, at 8 P.M. The meeting was called to order by President James H. Beal. The secretary called the roll of the Conference, showing a representation of twenty-one of the twenty-nine members of the Conference.

Vice-President McGill took the chair during the reading of the president's address, which had for its title, "The Purpose of the Conference." The recommendations in the president's address were as follows:

1. That a new by-law be adopted to read substantially as follows:

"Conditional members shall consist of such institutions as shall be recommended for election to conditional membership by the Executive Committee, and shall receive the affirmative votes of two-thirds of the members of the Conference represented at any annual meeting."

The conditional membership of an institution shall terminate in one year, unless the same shall be renewed by re-election. Institutions holding conditional membership may be elected to complete membership at any annual meeting, after the expiration of one year or more from the date of their election to conditional membership, in the manner and upon the terms prescribed by Article IV of the constitution.

2. That the incoming president appoint a committee of three to extend to the N.A.R.D., at its next convention, the greetings and good wishes of the American Conference of Pharmaceutical Faculties, and the said committee be especially instructed to express our cordial approval of the N.A.R.D. propaganda in favor of the more extended use of U.S.P. and N.F. preparations, and in favor of greater co-operation between the medical and pharmaceutical professions.

3. To amend Article IV, of the constitution as follows: Change the words "three-fourths" in the third line to "two-thirds." Also to add to said article the following: "If a majority of the members represented at any meeting of the Conference shall vote in favor of a candidate's admission, but the affirmative votes shall number less than the majority required for election, the votes of the members not represented at such meeting shall be taken by mail."

4. To amend Article XI of the constitution as follows: Change the words "three-fourths" in the eighth line to "two-thirds." Also add to said article the following: "Should such amendment receive the affirmative votes of a majority of the members represented at any meeting, but less than two-thirds of the total membership, the votes of the members not represented at said meeting shall be taken by mail, providing the affirmative votes of all the members not so represented would be sufficient to carry such amendment."

The president's address was referred to a committee consisting of Professors Remington, Anderson and Koch, who recommended that proposition No. 1, relating to conditional membership, should lay over for one year, although the committee favored the principle involved in its adoption. The committee concurred in the recommendations of the president in regard to the amendments to the constitution in Articles IV and XI, and the recommendation that delegates be again sent to the annual meeting of the National Association of Retail Druggists be carried out. They further recommended that the proceedings of the Conference be published in a cloth-bound volume and that the colleges represented in the Conference be assessed a sufficient amount to pay for them.

The report of the committee was unanimously adopted.

The report of the secretary-treasurer was read and adopted.

The report of the Executive Committee was made by the chairman, Professor W. A. Puckner, who announced the programme of the meeting, and also that the Buffalo College of Pharmacy, the New Orleans College of Pharmacy and Notre Dame University Department of Pharmacy had been elected to membership during the year by mail vote.

The committee appointed to consider the amendment with reference to the status of night-schools reported adversely upon action being taken at this time.

A communication from the Syllabus Committee was read by Professor Gregory, and on motion received and ordered published in the proceedings.

Dr. J. T. McGill read a paper entitled, "A Resolution in Regard to Pharmaceutical Degrees," in which the following was presented:

Resolved: That the American Conference of Pharmaceutical Faculties recommends:

1. A minimum preliminary educational requirement of high-school

work of four years for the degree of Doctor of Pharmacy, Phar.D., two years for the degree of Pharmaceutical Chemist, Ph.C., and one year for the degree of Graduate in Pharmacy, Ph.G.

2. That this standard be raised as rapidly as practicable to the preliminary requirement of four years of college work, *i. e.*, graduation in a college, for the degree of Doctor of Pharmacy, and four years of high-school work, *i. e.*, graduation in a high school or preparatory school of equal grade, for the degree of Pharmaceutical Chemist or the degree of Graduate in Pharmacy.

Discussion on this resolution was postponed until after the report of the Committee on President's Address, which report recommended that this subject be given more time for the framing of restrictions, and therefore advised that final action be postponed until the next annual meeting.

Professor Remington made a short report of the visit of the delegates to the meeting of the N.A.R.D., and urged that it was very important that another committee of delegates be sent to the next annual meeting. The report was accepted and the committee discharged.

At the second meeting of the Conference, there not being a sufficient number of members present to transact business, action upon the amendments to the constitution and by-laws was ordered to be taken by mail vote.

The Nominating Committee submitted the following names as nominees for officers for the ensuing year:

President, Dr. J. T. McGill, of Vanderbilt University, Nashville, Tenn.

Vice-President, Dr. C. B. Lowe, Philadelphia College of Pharmacy, Philadelphia, Pa.

Secretary and treasurer, Professor J. O. Schlotterbeck, School of Pharmacy, University of Michigan, Ann Arbor, Mich.

Chairman of executive committee, Professor W. A. Puckner, Illinois University, Department of Pharmacy, Chicago, Ills.

New members of the Executive Committee: Professor H. H. Rusby, of the New York College of Pharmacy, New York City, and Professor J. A. Koch, Pittsburg College of Pharmacy, Pittsburg, Pa.

They were unanimously elected.

PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

NOVEMBER MEETING.

The November meeting of the Philadelphia Branch of the American Pharmaceutical Association was devoted to a discussion of "The Official Standards and Tests."

The first paper to be presented on the subject was one entitled: "Comments on Some Official Standards and Tests," by Mr. L. Henry Bernegau, who discussed a number of observations that he had made relating to the purity rubric of the U.S.P.

He had encountered considerable difficulty in connection with the determinations of optical rotation of the essential oils. The specimens that he had seen differed widely from the official requirements in not a few instances.

Mr. Bernegau also discussed a ready method for the assay of solutions of nitro-glycerin and asserted that the loss of nitro-glycerin, in the making of tablets, was no doubt due to the evaporation in the process of granulation.

Mr. William M. Cliffe presented a communication on "Official Standards and Tests from the Standpoint of the Retail Druggist." He said: From the point of view that I have been requested to take in the discussion of the topic of the evening, the question of the standards and tests of the Pharmacopœia is one that is very important.

Through the position held by the retail pharmacist, as the distributor of pharmacopœial drugs and their preparations to the public, he is the one to whom the public will look for the maintenance of the standards that may be properly expected and exacted under existing laws.

It therefore follows as an absolute necessity that a retail pharmacist should be able and willing to accept the responsibilities of his position, logically occurring as a result of his relation to his customers.

While, owing to economic conditions, it is probable that alkaloidal assays will not be extensively performed in retail establishments, it still remains a fact that the retailer should possess the qualification necessary for this important branch of his work, if for nothing else than his own protection in cases where there is suspicion of deviation from required standards.

Another very practical feature of this question is that a reputation for ability, and proper espionage in the application of these tests protects the retailer from imposition on the part of jobbers and manufacturers, who may be unscrupulous enough to take advantage of a condition of laxity or ignorance; the return of goods on the verified grounds of non-conformity with legal standards is bound to make even the man who obeys the law as a matter of legal necessity, and not as a matter of abstract right, cautious about his dealings with one who is known to be an able stickler for the quality of the goods he buys.

Equally important with other phases of this question is the direct financial returns that come from ability and application on the part of the retailer. We have frequently seen the professional reputation that is a very important essential of a successful pharmacist's business seriously impaired by the inability or disinclination to effectively meet responsibilities of the character under discussion; and, on the other hand, have noted direct pecuniary returns and enhanced professional standing for one who was particular, even in the case of such a simple matter as the tests of the Pharmacopœia for a pure vegetable oil soap.

Mr. Charles E. Vanderkleed read a paper by Dr. A. R. L. Dohme and Dr. Herman Engelhardt, entitled "The U.S.P. Eighth Revision and its Relation to Some Drugs and Chemicals." This paper discusses at some length the changes that have been made in the eighth edition of the U.S.P., in the recently published corrections, and the authors also point out a number of instances in which the standards that have been established are not being complied with by the drugs on the market.

Among the substances that have been found to deviate from the established standards they enumerate: acetphenetidin, acid boric, asafetida, cerium oxalate, copaiba, jalap and a number of the volatile oils.

Prof. Henry Kraemer, in discussing the papers that had been presented, called particular attention to the need for retail druggists adapting themselves to changing conditions. Referring to the optical rotation of essential oils differing from the standards that had been established, he thought that it would be readily possible for this factor to be materially changed by a number of conditions, or the presence of materials, not necessarily contaminations, readily overlooked.

Professor Kraemer also referred to a number of changes in drugs and other substances that had come under his observation, evidently caused by the growth of micro-organisms or other of the lower vegetable forms of life. Taking all of these possible factors into consideration the wonder was that the Pharmacopœia has come as near being right as it has.

Prof. Joseph P. Remington, speaking as a member of the Committee on Revision, said that the experiences that have been gained during the past year will be of incalculable value to the committee in its future work. He laid considerable stress on the need for standards being such as are attainable and not too high. Essential oils he believed to be the most frequently adulterated of all medicinal substances.

Dr. F. E. Stewart, discussing the question of standards, said that he quite agreed with Professor Remington that standards for medicinal substances should be reasonable and attainable. For scientific progress in therapeutics doses must be founded on something substantial, and this could only be secured by having reasonably high standards that are guarded and complied with by pharmacists.

He believed, however, that pharmacists should go a step further than apply the tests of the Pharmacopœia to the materials that they themselves dispense. Having equipped themselves to do this work they should acquaint physicians with the need for such control and advise them to send their prescriptions to pharmacists who are in position to guarantee the genuineness and purity of the materials that they dispense.

Mr. M. I. Wilbert called attention to the fact that manufacturers could not be expected to guarantee their products after the original package had been broken and that the retailer, whether he wanted to or not, would be obliged to assume responsibility for all substances sold or dispensed other than those sold in the original package.

He also called attention to the fact that manufacturers and dealers are selling essential oils and other substances that are guaranteed to be compounded, or fit only for technical use, and that some retail druggists are buying these products for use in their prescription departments.

Dr. A. W. Miller, in discussing the labelling of adulterated or impure substances, called attention to the fact that at least one manufacturer of magnesium carbonate labelled his product as being

for technical use only, and was marketing another quality seven or eight times the price, as being of U.S.P. grade. So far as he could learn retail druggists were still buying the ordinary quality of magnesium carbonate for pharmaceutical uses.

The subject was further discussed by Messrs. Vanderkleed, Turner, Kraemer, Bernegau, Wilbert, Cliffe, Stanislaus and Pearson, also by Drs. Stewart and Miller.

At the suggestion of Professor Remington, the Executive Committee was instructed to consider the advisability of securing a larger hall for the next meeting, which is to be devoted to a discussion on "Nostrums and Newspaper Advertisements."

M. I. WILBERT,
Secretary.

DECEMBER MEETING.

The stated meeting of the Philadelphia Branch of the American Pharmaceutical Association, held on the evening of Tuesday, December 3, 1907, was devoted to a discussion of nostrums and newspaper advertisements.

Dr. John H. Musser discussed the "Evil Influences of Mystery, in Therapeutic Agents, upon the Science of Medicine," and made a strong plea for the elimination of all mystery, and falsehood from the practice of medicine. (See page 26.)

Dr. John B. Roberts, in discussing the physician's breach of trust—the use of secret remedies, asserted that the trust and confidence of the public in the physician, is truly phenomenal and it would appear as though it must be the primal duty of one who represents himself as a healer of the sick, that he fully knows what he essays to do. The physician who does not fully live up to this requirement, and particularly the prescriber of secret nostrums, is a dangerous quack, and is more to be shunned than the charlatan who has never had the advantage of medical training.

Dr. Henry W. Cattell, in a paper entitled, "The accurate knowledge of the composition of medicines prescribed by physicians is demanded," asserted that this requirement was axiomatic and referred not alone to the composition and uses of proprietary remedies, but of all remedies used in the treatment of disease.

He believes that the one predominating reason for the wide spread use of nostrums by physicians, is the fact that materia

medica is not properly taught in medical schools, and suggested that it might be well to effect an interchange of professors between colleges of pharmacy and medical schools, so as to give coming generations of physicians the advantage of having some knowledge of the resources and possibilities of modern pharmacy.

Dr. James M. Anders, in opening the general discussion, asserted that only in exceptional cases was secrecy of any kind permissible in the treatment of disease. One reason for the widespread use of secret or semi-secret proprietaries by physicians was the fact that the detail man usually presents his remedies, and the information that he may have to offer in connection with them, in a much more interesting manner than does the learned college professor. There is great need for controlling this really serious problem, and active missionary work must be taken up by the leading men of the medical profession, who must, themselves, become virtuous in this regard.

Dr. H. C. Wood, Jr., expressed the belief that the greatest sinners, so far as prescribing nostrums was concerned, were to be found among the leading men of the medical profession.

Mr. Edward Bok, the editor of the *Ladies Home Journal*, said that, as a layman, it was a pleasure to him to learn that the medical profession had realized that this problem is a matter for their very serious consideration. He believes that the people of this country are awakening to the dangers and the disgrace of the nostrum. Literary magazines, farm journals, religious papers and the better class of publications in all lines are ridding themselves of the advertisements of nostrums, which, he believes, will soon be restricted to the daily papers and the advertising pages of medical journals.

Mr. Bok severely arraigned the members of the medical profession for their widespread and evidently increasing use of nostrums, and enumerated a number of instances which appeared to evidence a degree of incompetency and inconsistency, on the part of medical practitioners, that is all but appalling.

Dr. David L. Edsall ventured the opinion that surface indications do not fully reflect the true value of the work that is being done. He believes that members of the medical profession are being influenced, changes are taking place and advances are being made. With the elimination of mystery from the art of medicine, and the possibility of pointing to a rational foundation for the use of drugs and other medicinal agents there must follow marked advances in the practical application of therapeutic measures.

Mr. Frank E. Morgan believed that the use of nostrums by medical men is rapidly decreasing, and that no man is more entitled to the respect of the community than the honest, earnest physician.

The subject was further discussed by Drs. Eaton, Lowe and Roberts, and by Messrs. Apple, Blair, Gabell, Osborne and Lemberger.

M. I. WILBERT,
Secretary.

DECEMBER PHARMACEUTICAL MEETING.

The regular Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, December 17th, with Wm. L. Cliffe in the chair; and was devoted to the consideration of analytical tests and methods.

Dr. A. W. Miller presented a communication on "The Distillation of Oil of Coriander," and exhibited several samples of the oil, and one of pot pourri made with crushed coriander fruit as one of the ingredients. The speaker stated that some of the coriander of the market is bleached, but said that he did not know whether the bleaching process affected the yield of oil (p. 15).

Mr. Weikel, of the Weikel and Smith Spice Company, Philadelphia, stated, that sometimes, when other commercial varieties of coriander are scarce, Russian coriander comes into the market, and that it is characterized by a heavy odor.

Reference having been made to the adherence of the mericarps of coriander fruit, Dr. Miller said, that he had frequently seen fruits in which the mericarps had separated, and thus become unsalable. Mr. Weikel said, that in the larger fruits, as the Italian, the separation of the mericarps is more likely to take place.

Dr. Miller stated that the amount of coriander used in pharmacy is very small as compared to that used in other ways, it being chiefly used in the manufacture of porter and brown stout, and also in sausage making, as a flavoring. He then spoke of the so-called "black caraway," which is largely used by the Russians as a flavoring material, and stated that it is composed of three-angled seeds, which yield a volatile oil that appears to contain a sulphur compound.

Mr. W. A. Pearson, of the analytical department of the Smith, Kline, and French Company, said that a yield of 1·1 per cent. of oil of coriander was reported by Eck (Gildemeister and Hoffmann's

"Ethereal Oils," English translation, page 542), but that as high a percentage of oil did not appear to be obtainable with the commercial fruits.

Mr. Charles E. Vanderkleed read a paper on "Some Tests for Gurjun Balsam in Copaiba," and demonstrated the manner of applying them (see page 11).

During the discussion of his paper Mr. Vanderkleed stated that the fluorescent property of copaiba is not regarded as a reliable indication of its quality. Mr. Pearson remarked that his experience with the tests for Gurjan balsam in copaiba coincided with that of Mr. Vanderkleed, except that he had always thought that the United States Pharmacopœial test was sensitive to less than 10 per cent. of Gurjun balsam. The D. and O. test he had found quite reliable if the solution were allowed to stand overnight. He said that he was making an analysis of African copaiba, which was low in acid resin and total resins, but otherwise answered the U. S. P. requirements. Mr. Pearson then alluded to the recent paper on copaiba by E. J. Parry, in which he stated that the optical rotation cannot be relied upon to indicate the quality of copaiba and that he had found the United States Pharmacopœial tests satisfactory.

A conjoint paper on "The Microscopical and Chemical Examination of Black Pepper," was presented by Henry Kraemer and Harry E. Sindall, the latter being the chemist for the Weikel & Smith Spice Company (see page 1). Professor Kraemer stated that this was the first of a series of similar papers which he and Mr. Sindall intended to present. Then taking up the subject of the paper, he said that while pepper is official in several of the pharmacopœias, little of it is used in medicine, its chief use being as a condiment, and it is being dropped from the pharmacopœias. He pointed out that there are a number of products official in the United States Pharmacopœia which are used as spices or for flavoring purposes, for which no definite standards are given, while the United States Government has adopted exact standards relating to the quality of these products. This, the speaker said, emphasized the desirability of the revisers of the Pharmacopœia taking advantage of scientific investigations pertaining to every official product, and of fixing high standards for them. Professor Kraemer demonstrated the histological structure of the pepper fruit by means of blackboard drawings, at the same time calling attention to the microscopical characters

distinguishing the chief adulterants of pepper now employed, after which he called upon Mr. Sindall to discuss the analytical data which he had obtained in the examination of samples of ground black pepper of known purity, and of commercial samples.

In commenting upon the paper Mr. Weikel stated that since the passage of the Pure Food and Drugs Law pepper hulls are the principal adulterant of black pepper, and that hulls low in ash are selected for this purpose. He said that some of the ground black peppers of the market are composed of cheap grades of white pepper and pepper hulls.

Others taking part in the discussion were Dr. C. B. Lowe, Ambrose Hunsberger, M. I. Wilbert and the chairman.

Attention was directed to some books and journals presented by Mrs. Shinn, widow of the late James T. Shinn; a series of botanical charts, presented by Mr. George M. Beringer. Professor Kraemer presented a copy of his recent text book on Botany and Pharmacognosy.

A vote of thanks was tendered the donors, and also the speakers of the afternoon.

FLORENCE YAPLE,
Secretary pro tem.